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CHANGING WAYS OF THINKING

A PAPER by Stephen Toulmin, in *On Nature*, edited by Leroy S. Rouner, published in 1984 by the University of Notre Dame Press, titled "Cosmology as Science and as Religion," might also be called "Farewell to the Seventeenth Century." Toulmin's point is that the world-view which was shaped in the seventeenth century, by Galileo and Descartes, Newton and Huygens, requiring "systematic detachment of observers from their objects of study; and secondly, an insistence on the need for scientific inquiry to be value-neutral"—that this outlook is slowly coming to a close.

What had the world outlook been until that period? Toulmin makes reply:

> From the time of the ancient Babylonians (approximately 1000 to 700 B.C.) right up to the high point of medieval Europe, the authoritative and established ways of thinking about the world of nature represented multi-purpose modes of thought: designed to tell us, at one and the same time, what the structure of nature was, how humanity and human affairs fitted into that structure, and even what relations nature and humanity bore to the gods.
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> From the beginning, the gods themselves were considered as natural powers; and one mark of the harmonious interaction of human beings with their natural world lay in their ability to master the operation of those powers. From this point of view, to devise a reliable calendar was to read the divine mind; to fathom the mysteries of the seas was to be on good terms with Poseidon; and so on. The cycles of the seasons, agriculture, and the tides were evidences of divine power and action, so human beings who mastered these cycles were keeping in step with both the forces of nature and also the associated divinities. Conversely, the fact that the natural cycles lend themselves to human mastery was further evidence that humanity is indeed at home within and in harmony with nature, and through nature with the divinities that lay behind the powers of nature.
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> This sense that human beings are linked in harmony with the scheme of natural things, and that they have their own distinct place within its overall orderedness, made the medieval world picture a true cosmology in the traditional sense of the term. And this same sense began to break down, at first piecemeal but later more comprehensively, in the years around A.D. 1600.

As Toulmin puts it: "Individualism had seized the public mind; no natural authority was recognized any longer; and the autocratic reign of Thomas Hobbes's *Leviathan* was just around the corner." Explaining, he says:

> The presuppositions of this program were, in due course, crystallized in Laplace's image of the Omniscient Calculator, the detached thinker who, given only the initial positions and velocities of all the particles in the universe at the moment of the creation, could in principle apply Newton's laws of motion to compute the entire subsequent history of the physical world. For such a thinker, that history would be a matter of purely factual concern, which in no way implicated one's own interests. In addition, this computation could be made in the first place only to the extent that the Calculator was looking in on the universe from the outside, being influenced by it without in any way affecting its operations in return. . . .
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> By the middle of the nineteenth century, many people had come to see the method of Modern Science as providing a universal recipe, not just for the study of inanimate nature but for rational inquiries of all kinds. So were born the notions of objectivity, value neutrality, and detachment that have recently been called into question, on the mistaken assumption that they are intrinsic to scientific thought rather than being exaggerations of the method appropriate to a particular subclass of scientific inquiries during a particular phase of history. . . .
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> The new phase in the historical development of the sciences that has been inaugurated as an outcome of these changes is so different in its central ideals and methods from that which held good from the 1620s to the 1920s that it may even deserve a new name. It is no accident, therefore that writers like Frederick Ferre choose to contrast the new phase in the sciences with its Cartesian and Newtonian forerunner by calling it the age of post-modern rather than modern science. I shall argue that it is a period in which all the main victories of the seventeenth-

century scientific revolution have been called into question, not least the divorce of humanity from nature. And once this "bifurcation of nature," as Whitehead called it, is successfully overcome, we are free to reconsider the separation of scientific cosmology from its religious aspects, which was one central consequence of that divorce.

One way of recognizing the difficulty in understanding these former ways of thinking, once we have abandoned them, is to study such languages in which comparable differences are now a part of a living tongue. A book which helps in this is Benjamin Lee Whorf's *Language, Thought, and Reality,* first published by the MIT Press in 1956. Whorf made a study of the Hopi language, showing how thought was preparatory to speaking. He wrote:

> Inner preparing is use of prayer and meditation, and at less intensity good wishes and good will, to further desired results. Hopi attitudes stress the power of desire and thought. With their "microcosm" it is utterly natural that they should. Desire and thought are the earliest, and therefore the most important, most critical and crucial, stage of preparing. Moreover, to the Hopi, one's desires and thoughts influence not only his own actions, but all nature as well. This too is wholly natural. Consciousness itself is aware of work, of the feel of effort and energy, in desire and thinking. Experience more basic than language tells us that, if energy is expended, effects are produced. We tend to believe that our bodies can stop up this energy, prevent it from affecting other things until we will our BODIES to overt action. But this may be so only because we have our own linguistic basis for a theory that formless items like "matter" are things in themselves, malleable only by similar things, by more matter, and hence insulated from the powers of life and thought. It is no more unnatural to think that thought contacts everything and pervades the universe than to think, as we all do, that light kindled outdoors does this. And it is not unnatural to suppose that thought, like any other force, leaves everywhere traces of effect. Now, when WE think of a certain actual rosebush, we do not suppose that our thought goes to that actual bush, and engages with it, like a searchlight turned upon it. What then do we suppose our consciousness is dealing with when we are thinking of that rosebush? Probably we think it is dealing with a "mental image" which is not the rosebush but a mental surrogate of it. But why should it be NATURAL to think that our thought deals with a surrogate and not with the real rosebush? Quite possibly because we are dimly aware that we carry about with us a whole imaginary space, full of mental surrogates. To us, mental surrogates are old familiar fare. Along with the images of imaginary space, which we perhaps secretly know to be only imaginary, we tuck the thought-of actually existing rosebush, which may be quite another story, perhaps just because we have that very convenient "place" for it. The Hopi thought-world has no imaginary space. The corollary to this is that it may not locate thought dealing with real space anywhere but in real space, nor insulate real space from the effects of thought. A Hopi would naturally suppose that his thought (or he himself) traffics with the actual rosebush—or more likely, corn plant—that he is thinking about. The thought then should leave some trace of itself with the plant in the field. If it is a good thought, one about health and growth, it is good for the plant; if a bad thought, the reverse.

While Whorf was not a scholar in the conventional sense he was fascinated by the languages of the Indians of the Southwest and made himself an authority on the meaning of the Maya Hieroglyphs, a master of the Hopi language and other Indian languages such as the Shawnee. Meanwhile he graduated from MIT as a fire prevention engineer and went to work for the Hartford Fire Insurance Co., rising as an executive of the company. His ability is clear from a story told of him:

> On one occasion while inspecting a chemical plant he was refused admission to a certain building on the ground that it housed a secret process. Even the head of the plant, to whom he was referred, insisted that no outsider could inspect this building. Whorf said, "You are making such and such a product?" The answer was "yes," whereupon Whorf picked up a pad, quickly wrote a chemical formula, and handed it to the head of the plant, saying, "I think this is what you are doing." The surprised manufacturer replied, "How in the world did you know, Mr. Whorf?", to which Whorf answered calmly, "You couldn't do it in any other way." Needless to say, he was admitted to the building which contained the secret process.

We go now to two other writers, Laura Thompson and Alice Joseph, who in 1944 wrote *The Hopi Way,* published in 1947 by the University of Chicago Press. These writers

enlarge somewhat on the conceptions that Whorf presents. They say:

> In the Hopi system of mutual dependency, which gives basic form to the universe, each individual, human or nonhuman, has its proper place in relation to all other phenomena, with a definite role in the cosmic scheme. . . . The Hopi believe that in the nature of each order "is the power of its own mode of duration: its growth, decline, stability, cyclicity, or creativeness. Everything is thus already 'prepared' for the way it now manifests by earlier phases; and what it will be later, partly has been, and partly is in the act of being so 'prepared'." . . .
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> The *Hopi Way* expresses, at the emotional and behavioral level, the Hopi world view. It is an integrated code containing rules for acting, feeling in every role which a human being, male or female, is required to assume in his life cycle from birth to death. . . .
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> It is interesting to note in this connection that the Hopi use the same word (no 'wakna) for "to will" and "to pray." Praying is willing. The Hopi believe not only that man can control nature to a limited account by observing these rules, but that if he does not do so, the universe may cease to function. That is, the movements of the sun, the coming of rain, the growth of crops, the reproduction of animals and human beings depend (to a certain extent at least) on man's correct, complete and active carrying out of the rules.

The authors make a thoughtful comment:

> The Hopi without using a single one of the forms of democracy which distinguish (and limit) the European tradition, live in democracy. Within the limitations of Hopi existence which are simply incalculable (they are fully told in this monograph), the Hopi realize freedom. Though individual short-cornering may wreck the society and even the universe, the Hopi believe, yet the individual's conduct and his thought, are finally left to himself. They bear one another's burdens. They enter deeply into community responsibility and give it their all. For the sake of the Race, the individual seeks ever to deepen into community responsibility and give to it their all. For the sake of the Race, the individual seeks ever to deepen and give form to his own consciousness. The Hopi have democracy, endure democracy, achieve democracy, with not one of those forms which, to too many minds, are the only tokens of the existence of democracy anywhere.

And so we turn to the recollections of Kathleen Raine of a visit, long years ago, to Old Oraibi, the Mesa in Arizona where the Hopis have lived for thousands of years. These recollections are fresh in our memory too, for we went there in 1948, the first year that MANAS was published, and talked with Indians already ancient, yet faithful to their tribal memories. Our readers, no doubt, will understand when we quote Kathleen Raine, the English poet, as saying:

> I have memories of a brief visit to Old Oraibi, a Hopi village in Southern Arizona. I believe that when I say that for me it was not so much like an exotic adventure as like a home-coming; many super-subtle fellow-citizens of London and New York and San Francisco and the rest will know that I speak for us all. Let civilization sink—it is sinking in any case and we all know it—and give us back sun, moon and stars, the hills and the sky and the winds and our lost world when times and places were ours, not to be renounced from hour to hour, from day to day and year to year because we have tasks to perform, compulsions to obey. Poets should keep faith with that primordial world, hold it ever before our eyes. . . . I had been invited to a conference in Los Angeles, and had chosen to make the journey by train because I wanted to see the scope and scale of America. . . . as we came to the West, nature soared in those great mountains still supreme in their wondrous skies. That was the America I longed to enter, to discover a life not superimposed by modern man but as old as the hills. . . .
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> And so, I know not how or why it was a destined part of my life, it came about that I found myself driving on those great modern motorways that cut through the age-old Arizona desert with its ecology of cacti and lizard, its clarity of skies, its seeming inviolateness though our very presence, the cars, the motorways, was a violation.

She met and became friends with some of the Hopis, who showed her their gardens, explained their beliefs. One of them was named Harry—for all Hopis are given Western names at school—who told her—

> That primordial unity with the earth was already under threat The modern men were constructing a ski-slope on Mount San Francisco where the Hopi gods lived above the summit—what gods can prevail against the profit-motive and the American cult of

> bodily fitness? There Henry told us the creation myth of this people; who had ascended up the hollow stem of a willow (or was it a rush?) to reach this world. There are five worlds, of which this is the third and lowest of the cycle. The fourth, he said, will be a little better, as we pass the lowest point of descent and begin to rise again towards the higher worlds from which we have descended. Even now here and there on this earth the fourth is beginning to appear. But before it comes, Henry said, "there will be bad times for my people." His mother had been a seer and she had known these things.

Kathleen Raine's visit to Old Oraibi was twenty years ago. Our visit was in 1948, the first year of publication of MANAS. We went at the invitation of Ammon Hennacy, an old friend, who knew the traditional Hopi by meeting them in prison where they had been placed for opposition to war. On the occasion of our visit three older Hopis, clan leaders, had decided to write a letter to President Truman objecting to the policies of the Indian Bureau. It is hardly necessary to say that the Hopis do not regard themselves simply as a small tribe of Indians, possessed of an interesting and admirable culture, to whom the white Americans ought to show consideration and justice. They are concerned with the fulfillment of the Hopi mission and destiny, the meaning of which has been handed down from generation to generation of the guardians of the Hopi religious philosophy. In their letter to Truman in 1928, Dan Kootschongeva and other Hopi leaders said:

> We are still a sovereign nation. Our flag still flies throughout our land (our ancient ruins). We have never abandoned our sovereignty to any foreign power or nation. We have been a self-governing people long before any white man came to our shores. . . .
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> Now we have heard about the Atlantic Treaty. . . . We have no enemy. We will neither show our bows and arrows to anyone at this time. This is our only way to everlasting life and happiness. Our tradition and religious training forbid us to harm, kill and molest anyone. . . . What nation who has taken up arms ever brought peace and happiness to its people?

They also protested the demand of the Government that Hopi land claims be filed with the U.S. Land Claims office. "We will not file any claims," they said, "because we have never been consulted in regard to setting up these provisions. . . . We have already laid claim to this whole Western hemisphere long before Columbus' great, great grandmother was born. . . . We think that white people should be asking for a permit to build homes on our land."

In another letter, sent earlier, the Hopi leaders requested that the drafting of Hopi men into the Army be stopped "because we Hopis have never made any treaty with your government whereby our young Hopi men and women would be subject to conscription laws of the United States."

The Hopi leaders had before them the statement of President Truman when he signed the Navaho-Hopi Bill, in which he said:

> . . . I also wish to assure the members of the Hopi and Navaho Tribes that their religion and social customs will be fully respected in accordance with this Nation's long established laws and traditions. . . .

Needless to say, this assurance has turned out to be completely meaningless. Yet we should remember that here is a handful of human beings who have lived on the mesas of Arizona for a thousand years or more. Old Oraibi, in particular, is an example, where will be found two-storey stone houses hundreds of years old. Other Indians, the Spanish, and finally the Americans, closed around them. Yet despite their peaceful ways, they have survived and kept true to their tribal convictions and customs. The traditional Hopi feels an almost messianic duty to his tribe, to other Indians, and indeed to the whole human race. He tries to practice the good life—the life of economic self-reliance and self-sufficiency, the life of brotherliness to other men and to all nature.

Essentially, the Hopis have an anarchist society. They have no chiefs in the familiar sense. They have secret societies or clans and the elders of these clans make the decisions that need to be made.

Visiting the Hopis makes an experience which generates respect for an ancient people and culture. The question is, why?

REVIEW
JOHN MUIR—AND THOREAU

ONE reason for reading a recent book—*Muir Among the Animals*, edited by Lisa Mighetto, and published by the Sierra Club ($17.95, in cloth)—is that it invites, or even drives the reader to think about his own attitude toward the other living things on the planet. Lisa Mighetto says:

> In contrast to humanitarians and conservationists, Muir presented all wild creatures favorably. Rattlesnakes, traditionally regarded as dangerous and repulsive, were, in his estimation, "downright bashful" and deserving of respect. Lizards, too, were "gentle and guileless" creatures with "beautiful eyes, expressing the clearest innocence, so that, in spite of the prejudices brought from cool, lizardless countries, one must learn to like them." Moreover, Muir delighted in the company of a variety of insects, including flies.

The material in this book comes from a wide range of sources, some of it previously unpublished, some from favorite works such as *Stickeen*, about Muir's beloved dog, some from *My First Summer in the Sierra*, some from pieces that appeared in *Century* and *Overland Monttly*. The first essay in the book is on "The Wild Sheep of California," in which Muir writes:

> In California, the wild sheep rank among the noblest of animal mountaineers. Possessed of keen sight, immovable nerve, and strong limbs, he dwells secure amid the loftiest summits of the Sierra, leaping unscathed from crag to crag, crossing foaming torrents and slopes of frozen snow, exposed to the wildest storms, yet maintaining a brave life, and developing from generation to generation in perfect strength and beauty. . . . I have been greatly interested in studying their habits during the last four years, while engaged in the work of exploring these high regions. In spring and summer, the males form separate bands. They are usually met with in small flocks, numbering from three to twenty, feeding along the edges of glacier meadows, or resting among the castle-like crags of lofty summits; and, whether feeding or resting, or scaling wild cliffs for pleasure, their noble forms, the very embodiment of muscular beauty, never fail to strike the beholder with liveliest admiration. . . .
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> In the months of June and July they bring forth their young, in the most solitary of inaccessible crags, far above the nest of the eagle. I have frequently come upon the beds of ewes and lambs at an elevation of from 12,000 to 13,000 feet above sea level. . . . Such is the cradle of the little mountaineer, aloft in the sky, rocked in storms, curtained in clouds, sleeping in thin, icy air; but wrapped in his hairy coat, nourished by a warm, strong mother, defended from the talons of the eagle and teeth of the sly coyote, the bonnie lamb grows apace. He learns to nibble the purple daisy and leaves of the white spiræa; his horns begin to shoot, and ere summer is done, he is strong and agile, and goes forth with the flock, shepherded by the same Divine love that tends the more helpless human lamb in its warm cradle by the fireside.

Climbing down the South Fork of the San Joaquin river, Muir rested a while, and to make some notes.

> Chancing to look across the cascade, there stood three wild sheep observing me within a few yards, calmly observing me. Never did the sudden appearance of human friend, or mountain, or waterfall, so forcibly seize and rivet my attention Anxiety to observe accurately on so rare an opportunity checked enthusiasm. Eagerly I marked the flowing undulations of their firm-braided limbs, their strong, straight legs, size, color, ears, eyes, heads; their graceful rounded necks, the upsweeping cycloidal curve of their noble horns. When they moved, I devoured every gesture; while they, in no wise disconcerted either by my attention or by the loud roar of the waters, advanced slowly up the rapids, often turning to look at me. Presently, they made a dash at a steep ice-polished incline, and reached the top without a struggle, by a succession of short, stiff leaps, bringing their hoofs down sharply with a patting sound. This was the most astounding feat of mountaineering I had ever witnessed.

This sort of description by Muir is far from being all that he wrote. We have picked what seem the most exquisite passage—to say nothing, for example, of the material on the Rocky Mountain goat—for attention. What is wonderful about this book is that Muir was there to see it, and that, seeing it, his writing about it becomes an act of devotion. What was it about John Muir, that he seemed to live in order to absorb the beauty of the mountains and its inhabitants, the

wonder of their lives, the drama of the excellences which became food for his soul? This question is the main reason for reading Muir. Why did he so love the natural world? And why does this love draw us to him? It is the same with reading Thoreau. Why, *why* this unmistakable attraction? Is there something in both of us that is the same, yet 'far better developed in men like that? Did they come to teach us something? If so, we are learning very slowly.

Muir writes about places we have heard of, perhaps visited, but for him they were as familiar as the streets on which we live are to us. Would they be so for us all in an ideal society? Should we learn to love the wild things as Muir loved them?

Muir has some reproachful words for ordinary mortals. He begins his essay, "Among the Birds of the Yosemite," by saying:

> Travelers in the Sierra forests usually complain of the want of life. "The trees," they say, "are fine, but the empty stillness is deadly; there are no animals to be seen, no birds. We have not heard a song in all the woods." And no wonder! They go in large parties with mules and horses; they make a great noise; they are dressed in outlandish, unnatural colors; every animal shuns them. Even the frightened pines would run away if they could. But Nature-lovers, devout, silent, open-eyed, looking and listening with love, find no lack of inhabitants in these mountain mansions, and they come to them gladly. Not to mention the large animals or the small insect people, every waterfall has its ouzel and every tree its squirrel or tamias or bird: tiny nuthatch threading the furrows of the bark, cheerily whispering to itself as it deftly pries off loose scales and examines the curled edges of lichens, or Clarke crow or jay examining the cones; or some singer—oriole, tanager, warbler—resting, feeding, attending to domestic affairs. Hawks and eagles sail overhead, grouse walk in happy flocks below, and song sparrows sing in every bed of chaparral. There is no crowding, to be sure. Unlike the low Eastern trees, those of the Sierra in the main forest belt average nearly two hundred feet in height, and of course many birds are required to make much show in them, and many voices to fill them. Nevertheless, the whole range, from foothills to snowy summits, is shaken into song every summer; and though low and thin in winter, the music never ceases.

We might here repeat Lisa Mighetto's observation that rarely did Muir have a good word for hunters. She adds:

> Summing up their utilitarian rationale for preservation he wryly noted that "the pleasure of killing is in danger of being lost from there being little or nothing left to kill." Muir, on the other hand, hoped for a recognition of the rights of animals and their kinship to ourselves."

It seems a good idea here to recall Thoreau's reflections on fishing and hunting in *Walden.* In the chapter, "The Higher Laws," he wrote:

> As for fowling, during the last years that I carried a gun my excuse was that I was studying ornithology, and sought only new or rare birds. But I confess that I am now inclined to think that there is a finer way of studying ornithology than this. It requires so much closer attention to the habits of the birds, that, if for that reason only, I have been willing to omit the gun. Yet notwithstanding the objection on the score of humanity, I am compelled to doubt if equally valuable sports are ever substituted for these; and when some of my friends have asked me anxiously about their boys, whether they should let them hunt, I have answered, yes,—remembering that It was one of the best parts of my education,—*make* them hunters, though sportsmen only at first, if possible, mighty hunters at last, so that they shall not find game large enough for them in this or any vegetable wilderness,—hunters as well as fishers of men. . . .
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> There is a period in the history of the individual, as of the race, when the hunters are "the best men," as the Algonquins called them. We cannot but pity the boy who has never fired a gun; he is no more humane, while his education has been sadly neglected. This was my answer to those youths who were bent on this pursuit, trusting that they would soon outgrow it. . . . Such is oftenest the young man's introduction to the forest, and the most original part of himself. He goes thither at first as a hunter and a fisher, until at last, if he has the seeds of a better life in him, he distinguishes his proper objects, as a poet or naturalist it may be, and leaves the gun and fish-pole behind. . . . I have found repeatedly, of late years, that I cannot fish without falling a little in self-respect. I have tried it again and again. I have skill at it, and, like many of my fellows, a certain instinct

> for it, which revives from time to time, but always when I have done I feel that it would have been better if I had not fished.

This, as moralist, is as far as Thoreau would go. Perhaps we are lucky that he went that far, but he did make it plain that he would not tell other people what to do, so we can read him without fear of feeling any pressure.

Muir was a different sort of man, not better or worse, but decidedly different. It would be a great mistake for us to make judgments about them when they both ranged so far beyond most of us.

We might conclude with a thoughtful passage about Muir by Lisa Mighetto, in which she says:

> It would be a mistake, however, to label Muir's view of the animal world sentimental. For all his observations of benevolence, he recognized that wild creatures can be dangerous: throughout his travels, Muir recorded his fear of bears, wolves, and alligators. But unlike his contemporaries, he refused to evaluate animal behavior by man's standards. "[I]t is right," Muir claimed, that creatures "make use of one another"; what bothered him was the spirit in which most humans use other animals. The egocentric assurance that the earth was made only for the pleasure and convenience of humans is "not supported by the facts," he argued in his journal. . . . What about the carnivores, he asked, who "smack their lips over raw man?" Speculation on the purpose of these troublesome beasts irritated Muir, who could not see why man should "value himself as more than a small part of the one great unit of creation."

COMMENTARY
"AS IF THEY WERE IMMORTAL"

THE interesting thing about what Stephen Toulmin has to say (see page one) is that he seems to treat the opinions which prevailed before the scientific revolution with the same respect that he shows for ideas that until quite recently were universally accepted by all educated persons. He calls attention to the fact that the notions of objectivity, value neutrality, and detachment are now being questioned, saying that "the medieval world picture" was "a true cosmology in the traditional sense of the term." The present, he says, "is so different in its central ideals and methods from that which held good from the 1620s to the 1920s that it may even deserve a new name."

Then, the quotation from Benjamin Lee Whorf, in his analysis of the Hopi language, is intended to show the reasonableness of the way the Hopis thought—and think—about their surroundings, calling it "wholly natural" that their thought about the natural world—in particular the corn plant—makes direct contact with what they think about. The thought actually affects the plant; it is not concerned only with a "mental image" we have formed of such a plant and held in imaginary space, but if they think "a good thought, one about health and growth, it is good for the plant; if a bad thought, the reverse."

For the Hopis, as Laura Thompson and Alice Joseph put it, "the movements of the sun, the coming of rain, the growth of crops, the reproduction of animals and human beings depend (to a certain extent at least) on man's correct, complete and active carrying out of the rules."

Our moralists these days write at great length about the importance of feeling ourselves at one with Nature, about the fellowship of life and the brotherhood of man, yet here we have, in the natural religion of the Hopis, and in their psychology and their language, a living example of a people who have applied these conceptions in daily existence for what may have been thousands of years. But in our everyday thinking and in our national policies, we regard the Hopis and other ancient peoples as "backward" and "primitive," and do not take them seriously.

At the same time, we both admire and ignore figures born of our own society—a Thoreau and a Muir—who have adopted attitudes very like those of the Hopis in certain respects. And when a youth in his adolescence gives evidence of becoming, as Edgar Friedenberg says, "a genuine revolutionary," and resolves to live in a pattern of behavior "based on his own homemade values," we tend to be embarrassed by him and do what we can to "impose a considerable strain on the boy."

Friedenberg recalls E.M. Forster saying that "The people I respect most behave as if they were immortal and as if society were eternal," and then asks:

> Is there anything we can do, as a matter of policy and conscious choice, to help more people behave "as if they were immortal and as if society were eternal?"

CHILDREN
. . . and Ourselves

WHAT IS ADOLESCENCE?

A BOOK now more or less forgotten has passages in it that should be kept alive by every generation of readers. Here we shall quote from some of these passages. The book is *The Vanishing Adolescent,* the author Edgar Z. Friedenberg. It was first published in 1959 by Beacon Press, and later became available as a Dell paperback. In answer to the question, What is adolescence? the author says:

> [Its] task is self-definition. Adolescence is the period during which a young person learns who he is, and what he really feels. It is the time during which he differentiates himself from his culture, though on the culture's terms. It is the age at which by becoming a person in his own right, he becomes capable of deeply felt relationships to other individuals perceived clearly as such. It is precisely this sense of individuality which fails to develop, or develops only feebly, in most primitive cultures or among lower-status social groups. A successful initiation leads to group solidarity and a warm sense of belonging; a successful adolescence adds to these a profound sense of self—of one's own personality.

Something else needs to be added here. In addition to the physiological changes and their emotional consequences there may be a birth of idealism, a dreaming of high achievement and noble intentions—qualities which have given to youth movements, generation after generation, the admirable traits that have left their mark on history. Theodore Roszak, in a recent article (in *San Francisco Focus,* June, 1987), spoke of this aspect of the 1960s when, despite various excesses, those years gave us "images of a freedom, naturalness, moral indignation and public candor that nobody can document as visible elements of the Eisenhower fifties, the Nixon-Carter seventies, the Reagan eighties." Roszak asks:

> When in living memory have we had more people in the streets, on the campuses, in the jails, in the daily news seeking to force upon the national conscience the hard questions of peace, justice, personal liberty, open government?

The stir of adolescence surely played a part in the emergence of these qualities.

Friedenberg questions whether the schools are much help in getting students through the ordeal of adolescence. He says:

> Adolescents are ill-served by schools which act as melting pots. When they get into a stew, it is best if the stew is like a properly prepared Japanese soup: crystal clear, with the individual qualities of all the odd ingredients preserved the soft things soft, the tough things tough, the green things green, and the yellow things yellow. From this kind of heterogeneity it is possible to learn something.
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> In this respect, the high school has been getting worse for years, for society has. It has always devoted itself to the interests of uniformity more than to individuality; but the uniformities used to be more *external* than they are now. I shall not labor the point, which has already been dealt with so thoroughly by Riesman, W. L. Whyte, and many others; but will simply point out that the school today is less a stew pot than a blender. What comes out, when it is functioning effectively, is not merely uniform but bland and creamy; by its very nature inimical to clarity, yet retaining in a form difficult to detect all the hostile or toxic ingredients present in the original mixture. . . .
>
> The modern school, then, serves people who lack the protections enjoyed by those who taught us what to expect of an educated class. It is also staffed by people who are, in fact, vulnerable to public opinion and dependent on the approval and support of their colleagues, even in matters of detail, in order to be effective.

Friedenberg writes at length about what he calls the lack of philosophic structure as the chief obstacle to the development of high school curricula—curricula "which would use our best cultural resources to help students to make sense out of the lives they actually lead." He goes on:

> The resources are there. One really has to be either a cultural snob or a professional alarmist to feel that American arts are barren today. Our poetry is good; our ballet may well be the best in the world, we have excellent literary critics, and they have excellent critics of their own; the *Partisan Review* snaps at the

New Yorker with the colorful fury of a moray eel attacking a parrot fish. The novel is said to be dying, and it is perhaps a clumsy form in which to attack the existential problems of contemporary life; but it is also extremely broad in scope. . . .

For Friedenberg, the search for the vanishing adolescent becomes a project in profound cultural criticism. The schools, he finds, are engaged in erasure, not in construction. He says:

> The process of becoming an American, as it goes on in high school, tends to be a process of renunciation of differences. This conflicts directly, of course, with the adolescent need for self-definition; but the conflict is so masked in institutionalized gaiety that the adolescent himself usually does not become aware of it. He must still deal with the alienation it engenders.. He may do this by marginal differentiation, like Riesman's glad-handing boy with the special greeting style. He may do it by erupting into bouts of occasional violent silliness, which does not make him seem queer to other people because it is unconsciously recognized as a form of self-abnegation rather than self-assertion, and is not, therefore, threatening. He may, if he has sufficient ego-strength, become the adolescent equivalent of a genuine revolutionary—rather than a rebel—that is, he may actually succeed in rejecting the folkways of the school without identifying with them and becoming guilty and raucous; he can then replace them with constructive patterns of behavior based on his own homemade values. This is a position which may lead to the growth of a splendid human being, but one which imposes a considerable strain on the boy.
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> In any case, he is unlikely to get much help from the school's routines.

It is natural that Edgar Friedenberg ends his book in a pessimistic mood. He finds adult anxieties about adolescent behavior probably more dangerous than anything the adolescents do. As he says:

> It is not that adult fears are groundless, or without substantial foundation. The adolescent behavior that disturbs them really occurs, and is really disturbing. However, adult response to the way adolescents act seems often to be influenced more by the adults' own unconscious needs and tensions than by what the adolescents are actually doing. The most obvious example is the popular outcry about juvenile delinquency. Juvenile delinquency is a hideous social fact and in its present form a comparatively recent one, though today's juvenile gangs have their historical precedents. It is hardly astonishing that it should arouse concern and indignation. But the kind of concern and indignation it arouses—the vindictive cartoons and columns in the papers, the just barely sub-pornographic accounts of gang activities, and the lusciously sadistic measures sometimes proposed for dealing with the miscreants—is neurotic, particularly in a population which has for some years endured with suspicious apathy the combined threats of lung cancer, atomic fall-out, and week-end motoring.
>
> There is obviously something in adolescence itself that both troubles and titillates many adults. The "teen-ager" seems to have replaced the Communist as the appropriate target for public controversy and foreboding, for discussions designed less to clarify what is going on than to let people vent their fearful or hostile feelings and declare themselves on the side of order and authority. As in the case of communism, there is a great deal really to be concerned about; but the quality of the concern is as distressing as the phenomena that are supposed to have aroused it.

In his closing pages Mr. Friedenberg says:

> It must be granted that in many respects our conception of integrity is obsolete; we include in it some ways of feeling and acting that acquired their significance under social conditions that no longer exist. Individualism, which led to success in a society dominated by the economic necessities of industrialization and empire, is a poor model for the young today.

He quotes from E. M. Forster that "The people I respect most behave as if they were immortal and as if society were eternal." Then he asks:

> Is there anything we can do, as a matter of policy and conscious choice, to help more people behave "as if they were immortal and as if society were eternal?"

This seems a good place to end.

FRONTIERS

The Mass Murder Machines

IN a new paper, *Zeta Magazine*, the first issue of which was published in January, in Boston, this year, Joseph Weizenbaum has an article which has a familiar ring, but which is so good that we don't much care if we have quoted from it before. Prof. Weizenbaum teaches computer science at the Massachusetts Institute of Technology and is author of *Computer Power and Human Reason*, which has been called "the classic statement on the use and abuse of computers." The article we speak of is an English translation of a talk he gave before the Association of Computer Professionals in West Germany in July, 1986. A fundamental introductory statement is this:

> None of the weapons that today threaten every human being with murder, and whose design, manufacture and sale condemns countless people to starvation, could be developed without the earnest cooperation of computer professionals. Without us, the arms race, especially the qualitative arms race, cannot march another step.

He illustrates his meaning by example:

> A doctoral student characterized his projected dissertation task as follows. A child, six or seven years old, sits in front of a computer display that shows a kitten and a bear in full color. The child speaks to the computer system: "The bear should say 'thank you' when someone gives him something." The system responds in a synthetic, but nevertheless pleasing voice: "Thank you, I understand." Then the child again: "Kitty, give your ball to your friend." Immediately we see the kitten on the computer display throw the ball to the bear Then we hear the bear say: "Thank you, my dear kitten."

It is all, as Weizenbaum says, "quite touching." But then he gives a translation to reality:

> A fighter pilot is addressed by his pilot's assistant system: "Sir, I see an enemy tank column below. Your orders please." The pilot: "When you see something like that don't bother me, destroy the bastards and record the action. That's all." The system answers: "Yes sir!" and the plane's rockets fly earthward.
>
> This pilot's assistant system is one of three weapons systems that are expressly described, mainly as a problem for artificial intelligence, in the Strategic Computing Initiative a new major research and development program of the American military. Over $600,000,000 are to be spent on this program in the next four or five years.

Developing the implications of his example, Prof. Weizenbaum says:

> The student mentioned above imagines his work to be about computer games for children, involving perhaps toy kittens, bears and balls. Its actual and intended use will probably mean that some day a young man, quite like the student himself, will be set afire by an exploding missile sent his way by a system shaped by his own research. . . . Just so should we ask ourselves about our own work. Once we have abandoned the prettifying of our language, we can begin to speak realistically and in earnest about our work as computer professionals.
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> "You, colleague of many years, you are working on a machine consisting of two to the fifteenth and more microprocessors running simultaneously. With the help of such a machine one can first simulate then construct much more efficient, small and lighter hydrogen bombs. Imagine, for a moment, you were an eyewitness at Hiroshima in 1945; you saw people stripped of their skin die. Would you want to make this happen thousands of times more? Would you so torture a single human being with your own hands? If you would not, regardless of what end would be served, then you must stop your work."

Some will say, Weizenbaum remarks, that the computer is "merely a tool" and can be used for either good or evil. Scientists and technologists, therefore, cannot be held responsible for the final application of their work. Yet there is a reply to this, which Weizenbaum makes:

> That point of view is manifested in the world famous Draper Laboratory, next door to the MIT building where I work. Draper is devoted almost entirely to missile guidance and submarine navigation. Many of the scientists employed there argue that the systems they work on can take men to the moon and bring them back, as well as guarantee that the missiles aimed at Moscow will actually hit Moscow, their target. They cannot know in advance, they say, which of these two or still other goals their work will serve in the end. How then can they be

held responsible for all the possible consequences of their work?

The doctoral student used as an illustration earlier may be doing work not sponsored by the Pentagon's Strategic Computing Initiative: how then can he be held responsible if his work is put to antihuman use? This brings Weizenbaum to his point:

> Here is where we reach the essence of the matter. Today we know with virtual certainty that every scientific and technical result will, if at all possible, be put to use in military systems. . .
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> The computer, together with the history of its development, is perhaps the key example. But we should also think in this connection of everything that has to do with flight, or of things atomic, of communications systems, satellites-space ships, and most of the scientific achievements of the human genius. We may then convince ourselves that in the concrete world in which we live, the burden of proof rests with those who assert that a specific new development is immune from the greed of the military.
>
> In these circumstances, scientific and technical workers cannot escape their responsibility to inquire about the end use of their work. They must then decide, once they know to what end it will be used, whether or not they would serve those ends with their own hands. . . .

The military may not be an evil in itself, Weizenbaum says, but there is this to consider:

> In the present state of the evolution of the nation-state—in other words, in the insane asylum in which we live—each state needs a military just as every city needs a fire department. But no one pleads for a fire station on every corner, and no one wishes for a city fire department that makes a side business of committing arson in the villages adjacent to the city.

And he also reminds us that when we are discussing atomic explosives and hydrogen bombs—

> Those aren't weapons, they are mass murder machines and mass murder machine delivery systems. That is how we should speak of them: clearly, distinctly, and without evasion. Once we recognize that a nuclear mass murder machine is nothing other than an instant Auschwitz—without railroads or Eichmanns or Dr. Mengele, but an Auschwitz just the same—can we continue then to work on systems that steer these devices to living cities?

Obviously, we need more scientists of the caliber of Prof. Weizenbaum.